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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,011	02/12/2002	Jun Kamatani	00684.003319.	6667

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EXAMINER
YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
1774	8

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/073,011	KAMATANI ET AL.	
	Examiner	Art Unit	
	Marie R. Yamnitzky	1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/12/02, 03/13/02, 05/08/02 & 06/28/02* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *4-6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 7-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-16* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3,4,7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. This application contains claims directed to the following patentably distinct species of the claimed invention: a metal coordination compound of formula (1) and a device comprising the compound wherein

M is one of Ir, Pt, Rh or Pd; and

m is one of 1, 2 or 3; and

n is one of 0, 1 or 2; and

for partial structure MLm, which is represented by formula (2), A is one of Ph to Fn1 as shown on pages 24-25 of the specification and B is one of formulae 6-14 as shown in claim 1; and

partial structure ML'n (if n is 1 or 2) is one of formula (3), (4) or (5) wherein A' of formula (3) is one of Ph-Fn1 as shown on pages 24-25 of the specification, and B' of formula (3) or B" of formula (4) is one of formulae 6-14 as shown in claim 1.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. In addition, applicant is required to select an ultimate species to be used as the starting point for search and examination purposes. Currently, claims 1-3 and 11-16 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Jason Okun on May 23, 2003, a provisional election was made with traverse to prosecute the species in which M is Ir, m is 3, n is 0, A is Ph and B is formula 11. Claims 1-3 and 7-16 read on the elected species. Compound 687 was selected as the ultimate species. Affirmation of this election must be made by applicant in replying to this Office action. Claims 4-6 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to non-elected species. (While some prior art is applied in the present action to non-elected species, this action should not be taken as an examination on the merits of all species encompassed by the claims.)

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it recites "represented by formula (1) below" but does not show the formula. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities:

In the reaction scheme shown on page 43, some of the subscripts overlap with other letters or symbols in the formulae.

Appropriate correction is required.

6. Claims 2 and 11-14 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the specific device constructions/compositions demonstrated in the examples to meet the limitations of these claims, does not reasonably provide enablement for these claims which allow for the use of any compound within the scope of formula (1) for the second compound, allow for the use of any non-luminescent first compound, and limit the composition of the luminescence layer only by requiring the second compound to be present in an amount of at least 8wt% (but less than 100 wt% since the first compound must be present) and in an amount greater than a compound represented by a generic formula encompassing numerous compounds would provide a certain (unspecified in the case of claim 2) characteristic. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

In order to determine whether a particular device meets the limitations of claim 2 and one or more of claims 11-14, one would have to test devices for various luminescence characteristics utilizing various combinations of first and second compounds and would have to test devices for various luminescence characteristics utilizing various concentrations of compounds of formula (1) which have no substituent in A/A' or B/B'.

Formula (1) encompasses hundred, if not thousands, of different compounds. The present specification defines 883 specific compounds within the scope of formula (1) and provides working examples of devices utilizing only a few of those 883 compounds.

Based on the few examples in the specification, it is unknown whether a particular combination of first and second compounds will meet the limitations of claim 2 for all possible luminescence characteristics or, for that matter, will meet the limitations of claim 2 for each of the four characteristics recited in claims 11-14. No combination is tested for all four characteristics. One would have to test devices comprising each possible combination in order to determine whether a particular device met the claim limitations of any of the four specified characteristics or any other unspecified luminescence characteristic. Further, all of the working examples of devices utilize the same first compound (CBP). It is unknown from the data provided whether different first compounds will affect the concentration at which a maximum luminescence characteristic is exhibited.

It is not clear from the few device examples in the specification whether there is any predictability as to what combinations of first and second compounds will provide devices meeting the limitations of claim 2 and one or more of claims 11-14. It is also unclear from the specification whether other unlimited device construction details, such as the presence of layers other than the luminescence layer, will affect the concentration at which a particular combination of first and second compounds will exhibit a maximum luminescence characteristic. One of ordinary skill in the art would have to perform undue experimentation to determine the scope of devices encompassed by claims 2 and 11-14 beyond the specific devices demonstrated in the specification to meet the limitations of claim 2 and one of claims 11-14.

7. Claims 1-3 and 7-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of a "non-luminescent" first compound as required by the present claims is not clear, particularly when considered in light of the device examples set forth in the present specification. The examples utilize CBP as the first compound, but CBP is a compound capable of exhibiting luminescence. For example, as disclosed by Baldo et al. (of record) in *Applied Physics Letters*, Vol. 75, No. 1, CBP is a blue emissive material having a peak emission wavelength of approximately 400 nm.

The metes and bounds of claims 2 and 11-14 are not clear because there are numerous compounds within the scope of a compound represented by formula (1) as defined in claim 1, there are numerous compounds within the scope of a compound represented by formula (1) but containing no substituent in any of the cyclic groups A, A', B and/or B', and there are potentially many compounds within the scope of the first compound which must be used in combination with the compound represented by formula (1). It is not clear what compounds and/or luminescence layers and/or luminescence devices must be compared in order to determine whether the limitations of these claims are met by a particular device.

It is also not clear if the language "containing no substituent in any of the cyclic groups A and A' or the cyclic groups B and B'" (emphasis added) means that there may be a substituent in A/A' if there is no substituent in B/B' and vice versa.

The metes and bounds of claim 2 are additionally unclear because the scope of "maximum luminescence characteristics" other than the four luminescence characteristics recited in claims 11-14 is not clear.

The scope of a "maximum luminescence characteristic" as recited in claim 3 is not clear.

The metes and bounds of claim 3 are also unclear because it is not clear if the claim is limited to those devices in which the compound represented by formula (1) is present at a concentration which provides a maximum luminescence characteristic.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3, 7-9 and 11-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Grushin et al. (US 2002/0121638 A1).

See the whole patent. In particular, see paragraphs [0002]-[0004], [0048]-[0049] and [0063]-[0065], and see the claims.

Grushin discloses iridium compounds represented by present formula (1) in which at least one cyclic group has a fluorine or fluorinated group as a substituent. As taught in paragraph

[0065], these compounds may be used in combination with other materials at concentrations of 8 wt% or higher.

Absent clarification of the claim limitations of claims 2, 3 and claims dependent from claim 2, Grushin's teachings in paragraph [0065] are considered to anticipate devices inherently meeting the limitations of these claims since Grushin teaches that the concentration of the iridium compound may be greater than the concentration at which $Ir(ppy)_3$ provides a maximum luminescence characteristic.

10. Claims 1-3, 7, 8 and 11-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Okada et al. (US 2002/0055014 A1).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

See the whole published application, especially paragraphs [0001]-[0005] and [0192]-[0251]. The device of Example 4 (see paragraphs [0247]-[0248]) meets the limitations of a device according to present claim 1. The formula for compound K-2 is shown on page 77 of the published application. Compound K-2 meets the limitations of a compound of formula (1) as defined in present claim 1 and further defined in claims 7 and 8. The concentration of compound K-2 in the luminescence layer of Example 8 is about 11.8 wt%.

Absent clarification of the claim limitations of claims 2, 3 and claims dependent from claim 2, the device of Okada's example 4 is considered to inherently meet the concentration

limitations of claims 2, 3 and 11-14 since the concentration of compound K-2 is greater in that device than the concentration of $Ir(ppy)_3$ (compound K-1) which provides a maximum luminescence characteristic per the admitted prior art (see page 9, lines 8-14 in the present specification).

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-3 and 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grushin et al. (US 2002/0121638 A1) as applied to claims 1-3, 7-9 and 11-16 above, and for the further reasons set forth below.

Grushin discloses several specific compounds within the scope of a compound of present formula (1) as defined in claim 1 and further defined in claims 7-9. Grushin also suggests other compounds within the scope of a compound of present formula (1) as defined in claim 1 and further defined in claims 7-10. With respect to present claim 10, Grushin teaches that the compounds may comprise an alkyl group as a substituent (see paragraph [0039]).

Further, with respect to claims 2, 3 and 11-14, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the luminescence characteristics of a device comprising an iridium compound according to Grushin.

13. Claims 1-3 and 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al. (US 2002/0055014 A1) as applied to claims 1-3, 7, 8 and 11-16 above, and for the further reasons set forth below.

The device of Okada's example 4 utilizes a specific compound within the scope of a compound of present formula (1) as defined in claim 1 and further defined in claims 7 and 8. Okada also discloses other compounds within the scope of a compound of present formula (1) as defined in claim 1 and further defined in claims 7, 8 and 10, and suggests additional compounds meeting the compound limitations of the present claims. For example, with respect to the compound as further defined in claims 7 and 10, see K-7 and K-8 on page 78. With respect to the compound as further defined in claim 9, a trifluoromethyl substituent would have been obvious to one of ordinary skill in the art at the time of the invention given Okada's disclosure of methyl as a substituent and fluorine as a substituent, and Okada's teachings that substituents may be further substituted (see paragraph [0037]), trifluoromethyl being a substituted methyl.

It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to utilize other metal complexes specifically disclosed by Okada or suggested by Okada in place of compound K-2 in a device such as the device of Example 4. One of ordinary skill in the art would have reasonably expected that other metal complexes disclosed or suggested by Okada as being usable for the same purposes as compound K-2 could be used in place of compound K-2 in the device of Example 4.

Further, with respect to claims 2, 3 and 11-14, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the luminescence characteristics of a device comprising a metal complex according to Okada.

14. Claims 1-3 and 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US 2001/0019782 A1).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Igarashi discloses various iridium compounds represented by present formula (1) as defined in claim 1 and further defined in claims 7-10, and suggest numerous other compounds within the scope of compounds represented by present formula (1). For example, the compounds of formulae (1-4) and (1-5) as shown on page 10 of Igarashi's published application are compounds of present formula (1) as further defined in claims 7 and 10. As another example, the compound of formula (1-61) is a compound of present formula (1) as further defined in claims 7 and 9. The iridium compounds are disclosed for use as a light emitting material in an organic luminescence device (e.g. see paragraphs [0002]-[0004]).

Igarashi does not specifically limit the concentration of the iridium compound in the luminescence layer of the device, but Igarashi's examples demonstrate that Igarashi's iridium compounds may be used at concentrations of at least 8 wt% (e.g. the concentration of the iridium

compound in the devices of Examples 15, 19 and 20 is 10 wt%; the concentration of the iridium compound in the device of Example 16 is 100 wt%).

While Igarashi does not disclose a specific example of a device having a luminescence layer comprising 8wt% or greater of a compound represented by present formula (1), it would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable and optimum concentrations for Igarashi's iridium compounds. One of ordinary skill in the art would have reasonably expected that functional devices could be provided using the various iridium compounds disclosed or suggested by Igarashi at concentrations greater than 8 wt% since Igarashi demonstrates functional devices at concentrations greater than 8 wt%.

Regarding claims 2, 3 and 11-14, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the luminescence characteristics of a device comprising an iridium complex according to Igarashi.

15. Miscellaneous:

In line 10 of page 77 and line 1 of page 78, a second closing parenthesis should be inserted before the closing bracket to balance out the opening parentheses.

In the eleventh line of claim 2, "an cyclic group" should be changed to --a compound-- because formula (1) represents a compound rather than a cyclic group per se.

16. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

The published applications of Igarashi et al. (US 2002/0024293 A1) and D'Andrade et al. (US 2002/0197511 A1) are additional patent applications having an effective U.S. filing date between the U.S. filing date and the foreign priority date of the present application, which disclose compounds represented by present formula (1) and disclose or suggest that compounds represented by present formula (1) may be used at concentrations of 8 wt% or higher in the luminescence layer of an organic luminescence device.

17. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax numbers for Art Unit 1774 are (703) 872-9311 for official after final faxes and (703) 872-9310 or (703) 305-5408 for all other official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY
July 24, 2003

Marie R. Yamnitzky

MARIE YAMNITZKY
PRIMARY EXAMINER

1774